

## *Lambda 365 Single Cell Peltier Holder, Controller Installation Instructions*

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This instruction sheet describes the installation of this accessory which is used with the Lambda 365 Spectrophotometer.

**NOTE:** *Read these instructions before you install this accessory.*

### ***Contacting PerkinElmer***

Supplies, replacement parts, and accessories can be ordered directly from PerkinElmer, using the part numbers.

See our website:

<http://perkinelmer.com>

PerkinElmer's catalog service offers a full selection of high-quality supplies.

To place an order for supplies and many replacement parts, request a free catalog, or ask for information:

If you are located within the U.S., call toll free 1-800-762-4000, 8 a.m. to 8 p.m. EST. Your order will be shipped promptly, usually within 24 hours.

If you are located outside of the U.S., call your local PerkinElmer sales or service office.

### ***Features***

- Full software control
- Liquid cooling system
- N<sub>2</sub> gas purging available



**Figure 1 Peltier Temp Control Unit (Single) w/ Reference Heating [P/N: N4101010]  
or Peltier Temp Control Unit (Single) w/o Reference Heating [P/N: N4101009]**



PerkinElmer, 710 Bridgeport Avenue,  
Shelton, CT 06484-4794, U.S.A

Produced in the USA.

## *Dimensions and Specifications*

### *Peltier Controller*

Physical Characteristic	Specification
Power	100-240 VAC, 50/60 Hz, 300W, Free Voltage
Temperature Range	-5 to 100°C (Maximum Internal Temperature)
Maximum Ambient Operating Temperature	40°C
Dimensions	310 (W) x 410 (D) x 275 (H) mm (12.2 (W) x 16.1 (D) x 10.8 (H) in)
Weight	20.0 kg (44 lb)
Coolant Volume	2 L
N <sub>2</sub> Gas Available	100 psi (6.9 bar)
Liquid Cooling System	
Magnetic Stirrer Control Available	
Emergency Power Off Switch Available	

### *Specifications of Single Cell Peltier Holder (with and without heated reference)*

Physical Characteristic	Specification
Number of Sample Cells	1
Number of Reference Cell	1 (with or without heated reference)
Dimensions	135 (W) x 304 (D) x 140 (H) mm (5.3 (W) x 12.0 (D) x 5.5 in)
Weight	With heated reference: 2.4 Kg (5.3 lb) Without heated reference: 1.9 Kg (4.2 lb)
Temperature Accuracy	±0.15°C
Temperature Precision	±0.1°C
Temperature Stability	±0.1°C
Ramping Time (from 0 to 100°C)	5minutes

## Safety Warnings



**WARNING**

*When this label is attached to an instrument it means refer to the manual.*

*Lorsque cette étiquette est attachée à un instrument, il est nécessaire de voir le manuel.*



**WARNING**

*There is risk of receiving a fatal electric shock if the fuses are replaced with the power cord connected.*

*Il y a un risque d'électrocution si les fusibles sont remplacés tandis que le cordon d'alimentation est encore branché.*

See the following figure for the location of warning labels on the back of the instrument:



**Warning**  
To prevent electrical shock,  
do not open cover.  
Refer all servicing to qualified  
personnel.

**Avertissement**  
Afin d'éviter tout risque  
d'électrocution ne pas enlever  
ce couvercle.  
Faire appel au service Après-  
Vente.

**Warning**  
**FUSE**

**Avertissement**  
**FUSE**

**Warning**  
For continued protection against  
electrical shock, replace with  
same type and ratings of fuse.

**Avertissement**  
Pour assurer la protection contre  
le risque de choc électrique,  
remplacez le fusible seulement  
avec le même type et la même  
valeur nominale.

## ***Configuration of Peltier Temp. Control Unit (Single)***

Single Cell Peltier Holder (with heated reference or without heated reference)

Peltier Controller

Power Cord, 3 ea

Interface Cable (RS-232 and USB to RS-232), 1each

Spare Fuse (AC 250V T5AL), 2ea

Temperature Probe, 1ea

Magnetic Stirrer, 2 ea (with heated reference) or 1 ea (without heated reference)

Coolant Hose, 1 ea

Coolant, 2 ea

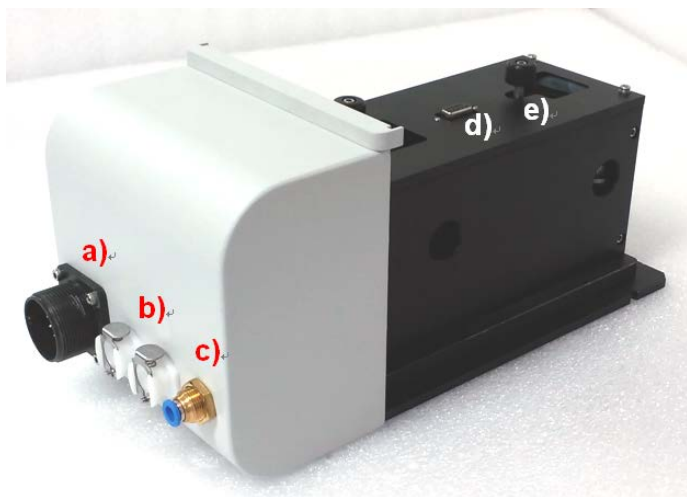
Waste Basket for Coolant, 1 ea

Waste Hose for Coolant, 1 ea

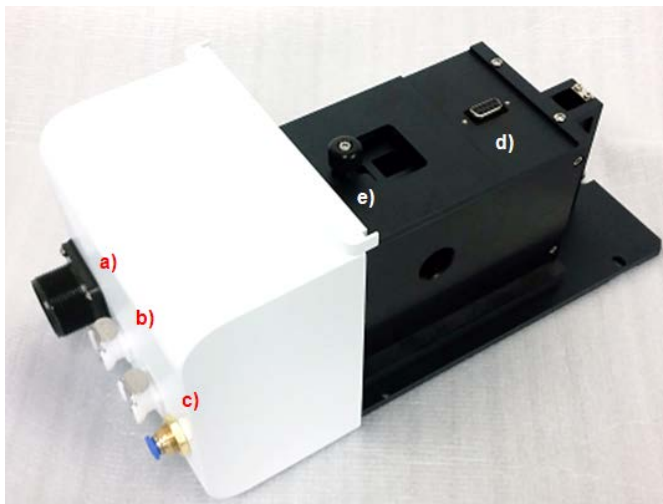
Phillips round head screw with washer, 2 ea

## ***Description***

***Single Cell Peltier Holder (with heated reference or without heated reference)***



**Figure 2-1 Lambda 365 Single Cell Peltier Holder (with heated reference)**



**Figure 2-2 Lambda 365 Single Cell Peltier Holder (without heated reference)**

- a. Interface connector between Single Cell Peltier Holder and Peltier Controller
- b. Coolant Inlet/Outlet Quick Coupler
- c. N<sub>2</sub> Gas fitting
- d. Interface slot for Temperature Probe
- e. Cell Lifting knob
- f. Phillips round headscrew with washer



Used to fix a cell holder, a base plate or a front plate for Lambda 365.

Spare screws (2ea) are enveloped with the accessory.

**Figure 3 Phillips round head screw with washer (M4 \*12L)**

- g. Temperature Probe



**Figure 4 Temperature probe**

## Peltier Controller

### Front View of Peltier Controller



**Figure 5** Front view

- a. **Manual touch pad with Display:** Temperature Control Unit (Heating/Cooling Block)
- b. **LED Indicators:** Display the status of the operation of Coolant Circulation, Fan, Pump, etc. (If there is any problem in the components, Red LED will flash with beep alarm.).
- c. **Manual ON/OFF button:** As the Manual ON/OFF button is ON, the temperature can be controlled manually by a) Manual touch pad with Display.

**NOTE:** *Manual operation is used only for the manufacturer so it should be turned off during the measurement.*

- d. **N<sub>2</sub> gas ON/OFF button:** It is used for using N<sub>2</sub> gas to remove the frost from the heating and cooling.
- e. **Stirrer ON/OFF button:** It is used for controlling of the stirring.
- f. **Stirrer Speed Controlling Knob:** Control the stirring speed (rpm).
- g. **Emergency switch:** Stop all operations in an emergent situation.

**NOTE:** *During the operation, Emergency switch should be turned off.*

- h. **Coolant Inlet**

### *Rear View of Peltier Controller*



**Figure 6 Rear view**

- a. **RS-232 port**
- b. **AC Power:** Main Power ON/OFF
- c. **Fuse:** AC socket + Fuse Holder
- d. **Interface:** Interface cable for connecting with Peltier Single Cell Holder
- e. **Air Vent Manual button:** It is used for removing the air in the coolant hose.
- f. **Buzzer:** It makes an alarm sound. If there is any problem before the measurement, Buzzer beeps 6 times at every 10 sec. If the malfunction occurs during the operation, Buzzer beeps twice at every 10 sec.
- g. **Quick Coupler of Coolant Inlet/Outlet**
- h. **Quick Coupler of Coolant Drain**
- i. **N<sub>2</sub> Gas Inlet/Outlet ports**

**NOTE:** *N<sub>2</sub> gas is not always required [Tube for N<sub>2</sub> gas is not supplied with the accessory].*

- j. **Flow Gauge:** Indicator of the flow rate of N<sub>2</sub> gas.

## Installation

<b>CAUTION</b>	<i>Make sure the instrument is turned off while installing this accessory.</i>
<b>ATTENTION</b>	<i>Assurez-vous que l'instrument est éteint lors de l'installation de cet accessoire.</i>

1. Prepare the Lambda 365 and Peltier Controller in a location that is compatible with the required environmental conditions for the operation.
2. Open the lid of the coolant inlet on top of the Peltier Controller.



**Figure 7 Lid of coolant inlet**

3. Fill up the liquid coolant using the funnel.

<b>CAUTION</b>	<p><i>Liquid coolant should be used as refrigerant. Do <b>not</b> use any water (tap water, DI, etc.). If water is used as refrigerant, the Peltier Controller's components might be corroded and its performance may be deteriorated.</i></p> <p><i>Use any kind of liquid coolant of normal grade that is available. (e.g. liquid coolant including Distilled Water 70 wt%, Propylene Glycol 27 wt%, Additives 3 wt%).</i></p>
<b>ATTENTION</b>	<p><i>Le liquide de refroidissement doit être utilisé comme réfrigérant. N'utilisez jamais d'eau (eau du robinet, eau déminéralisée, etc.) L'eau risque en effet de corroder les composants du contrôleur Peltier et de réduire les performances de ce dernier.</i></p> <p><i>Utilisez un liquide de refroidissement du commerce de qualité normale (par exemple, un liquide de refroidissement à base d'eau distillée à 70 % M/V, de propylène glycol à 27 % M/V et d'additifs à 3 % M/V).</i></p>

**NOTE:** *Keep the amount of liquid coolant to the level where the indicator is located between the 'L'(low) and 'H'(high) mark in the scale on the left side of the Peltier Controller. When the coolant is running short for the operation, LED of Low Water Level is changed red with alarm sounding.*



4. Connect the power cord and communication cable of the Lambda 365.
5. Remove the two Phillips round head screws with washer (M4\*12L) to disassemble the existing cell holder and base plate.



**Figure 8 Location of Phillips round head screws with washer**

6. Pull out the cell holder and base plate by hand.



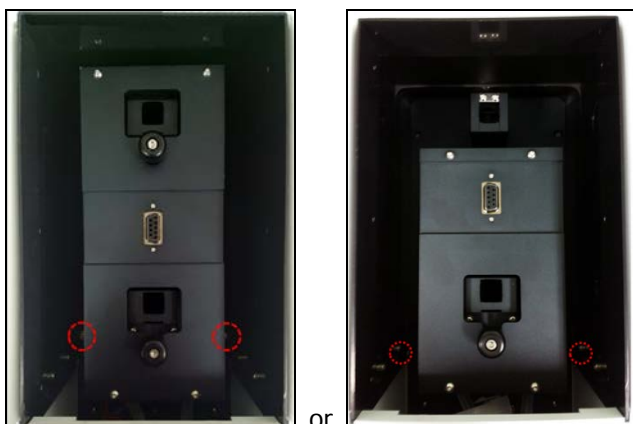
**Figure 9 Pulling out the cell holder and base plate**

7. Insert the single cell peltier holder in the cell compartment.



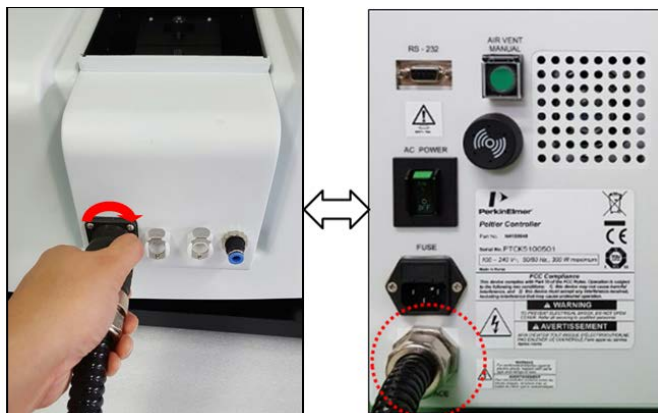
**Figure 10 Inserting the Single cell peltier holder**

8. Fix and tighten the single cell peltier holder with the Phillips round head screws.



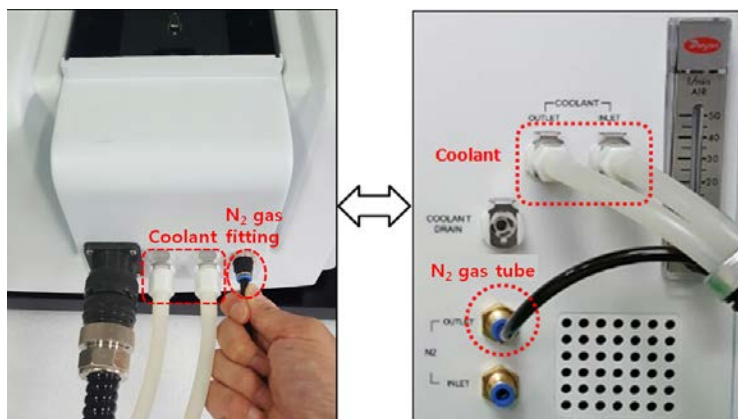
**Figure 11 Location of screws (with heated reference or without heated reference)**

9. Connect the accessory interface cable of the Peltier Controller to the interface connector of the single cell peltier holder.



**Figure 12 Connecting the accessory interface cable of the Peltier Controller**

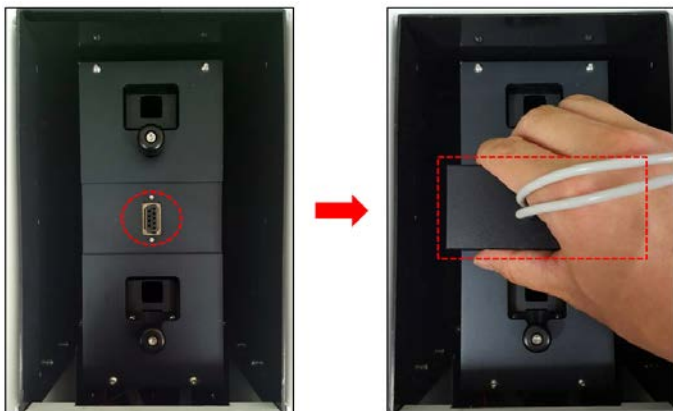
10. Connect the coolant inlet/outlet and N<sub>2</sub> gas tube between the Peltier Controller and the single cell peltier holder.



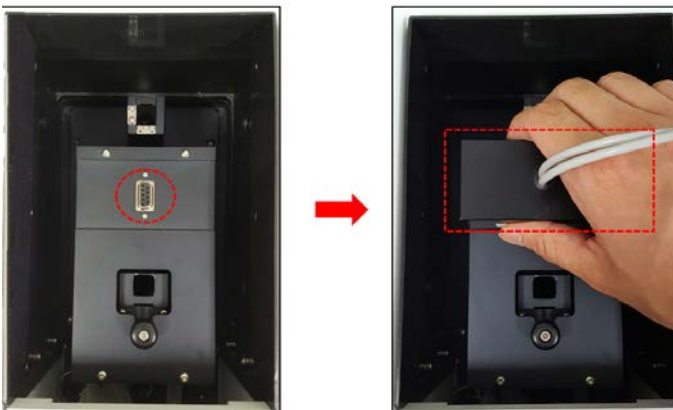
**Figure 13 Connecting the coolant inlet/outlet and N<sub>2</sub> gas fitting between the Peltier Controller**

**NOTE:**  $N_2$  gas is not always required. If no gas is applied, user does not have to connect  $N_2$  gas tube.

11. Connect the temperature probe to the interface slot of the single cell peltier holder.



**Figure 14** Connecting the temperature probe (single cell peltier holder with heated reference)



**Figure 15** Connecting the temperature probe (single cell peltier holder without heated reference)

12. Connect the Peltier Controller with the PC via the RS-232 or USB to RS-232 cable.



**Figure 16** Connecting the Peltier Controller with the PC

13. Connect the power cord to the Peltier Controller.



**Figure 17 Connecting the power cord**

14. Turn on the AC power switch of the Lambda 365 and the Peltier Controller.

**CAUTION**

*The Air vent manual button should be off before turning on the main power of the Peltier Controller and also during the operation since it could make a trouble for the communication between Lambda 365 and Peltier Controller.*

**ATTENTION**

*Le bouton d'actionnement manuel de la ventilation doit être désactivé avant que le contrôleur Peltier ne soit mis sous tension et pendant le fonctionnement de ce dernier afin d'éviter qu'une erreur de communication entre le Lambda 365 et le contrôleur Peltier ne se produise.*



**Figure 18 Turn on the AC power switch**

15. Check that the Power LED is on as a blue light.



**Figure 19 Location of Power LED**

**CAUTION**

*If you hear the alarm sound during the operation, push the emergency switch to stop all functions immediately and check the status of Peltier Controller carefully. Then, turn the switch to the right again when everything is solved properly and the functions will be on again.*

**ATTENTION**

*Si l'alarme se déclenche en cours de fonctionnement, appuyez sur l'interrupteur d'urgence pour arrêter immédiatement toutes les fonctions et contrôlez soigneusement l'état du contrôleur Peltier. Ensuite, tournez à nouveau l'interrupteur vers la droite une fois la situation rétablie afin de restaurer les fonctions.*



**Figure 20 Location of Emergency Switch**

**NOTE:** *Peltier controller can be compatible with various peltier cell holders (single or Multi). Whenever you exchange the existing peltier cell holder to another one, you should perform the "Auto Tuning" setup referring to the chapter: **Peltier Controlled Auto Tuning Setup** (p27).*

16. Turn off the power after the experiment.

***How to Drain the Coolant From the Peltier Controller***

- a. Push the **Air Vent Manual** button to be switched on the rear panel of Peltier Controller before operation.
- b. Connect the waste hose to the Coolant Drain port on the rear panel and prepare a waste bucket.
- c. Turn on the power of Peltier Controller, and then coolant will be drained automatically.
- d. Once draining is complete, turn off the power of Peltier Controller.

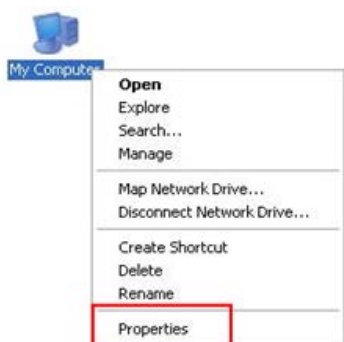
## Setting USB to RS-232 Cable

**NOTE:** When using the RS-232 cable, the COM Port is set automatically.

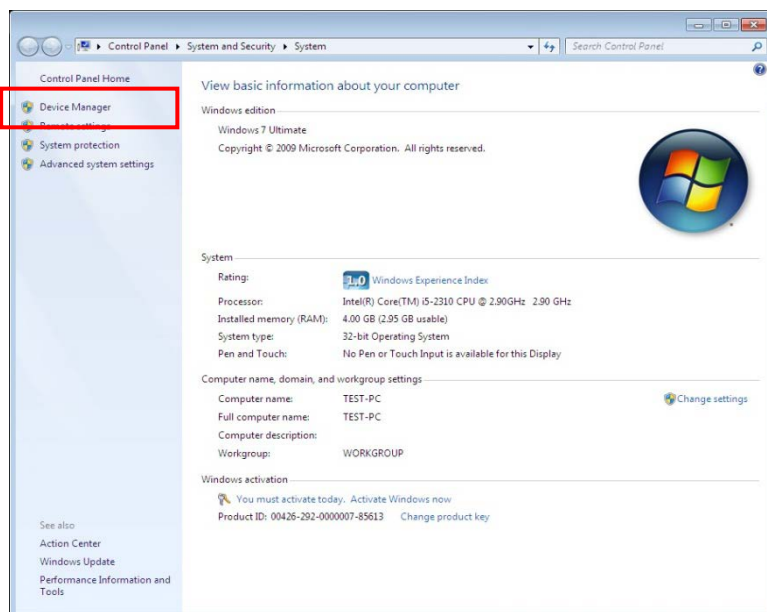
When using the USB to RS-232 cable, USB to RS-232 Driver has already been installed when installing the Lambda 365 and UV Express software, user does not need to install it again.

When the communication by the USB to RS-232 converter is not established, change the port setting as follows;

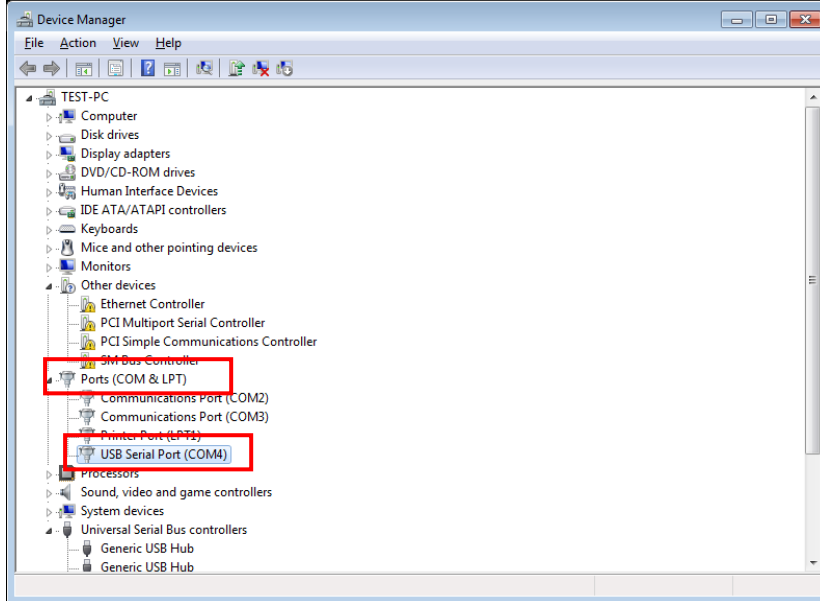
1. Select **My Computer** → **Properties**.



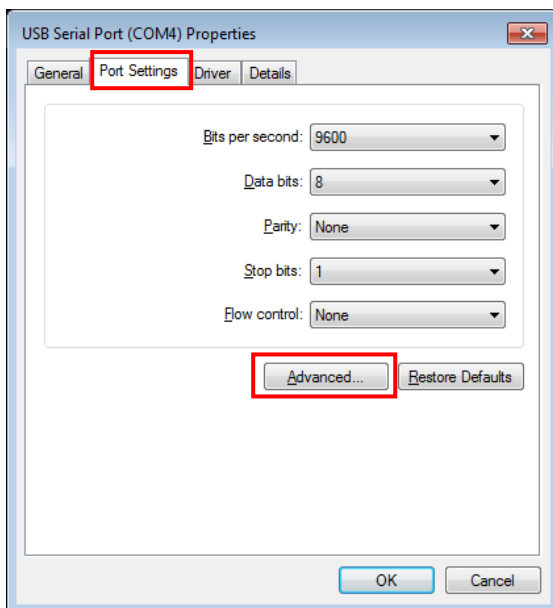
2. Select **Device Manager**.



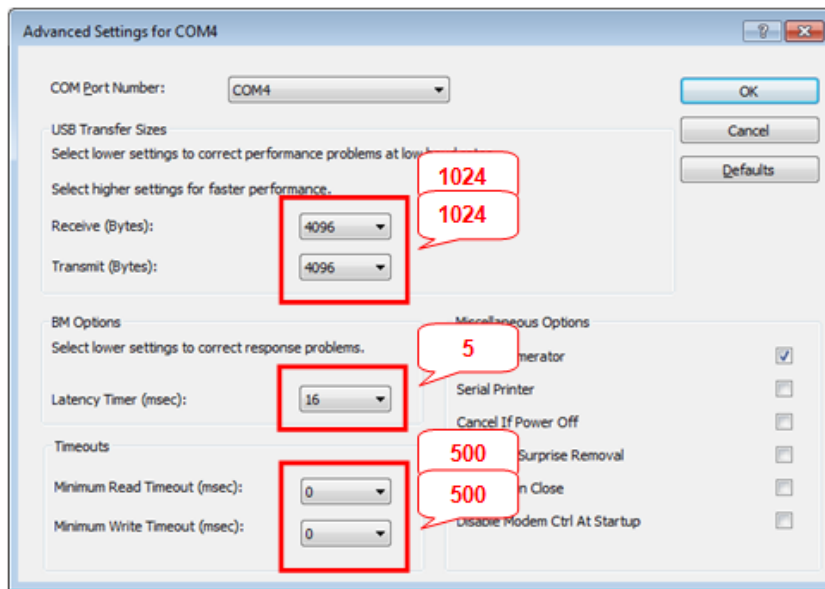
3. Select **Ports (COM & LPT)** to expand the listing. These are the devices currently connected to the COM ports. **USB Serial Port (COMx)** is listed when the driver installation is completed successfully.



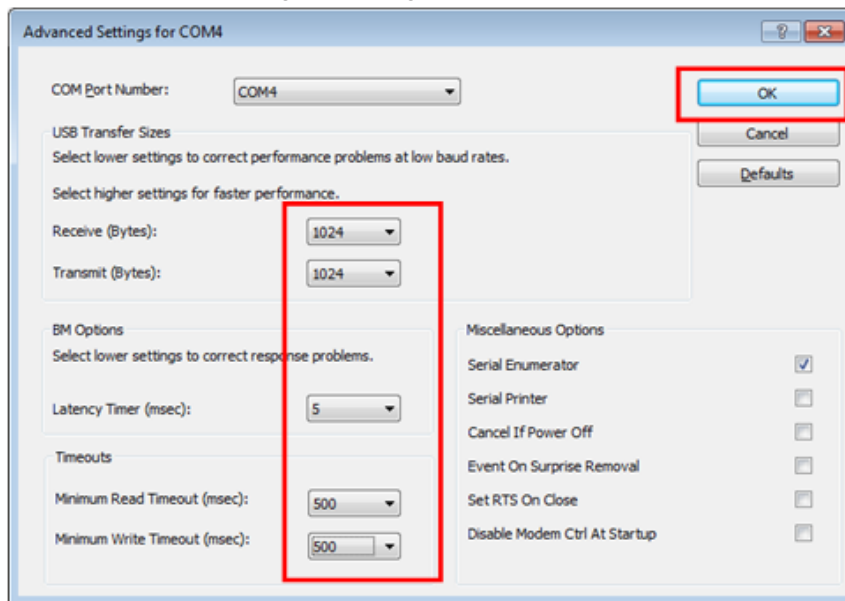
4. Double click on the **USB Serial Port (COMx)** of the **Ports (COM & LPT)**.
5. Select the **Port Settings** tab and select the **Advanced...** button.



6. Change the parameter values as shown below.



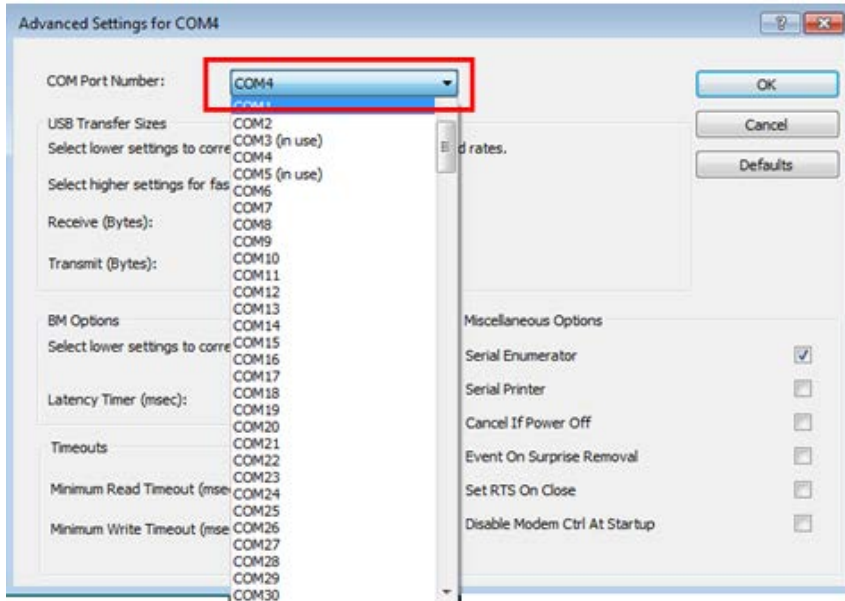
7. Select **OK** after checking the changed parameter values.



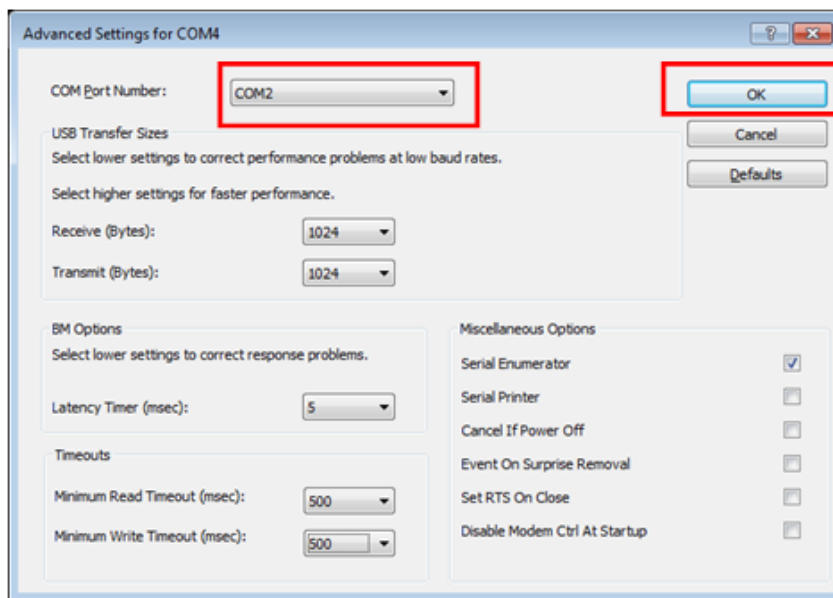
8. If the Peltier controller fails to communicate with the PC, change the COM Port Number by the following steps.
9. Open the **Advanced Setting for COMx** window again by repeating the steps 1 to 6.



10. Select the **COM Port number list** to expand it and change the COM port number to another one which is not in use from COM 1 to COM 10.



11. Make sure that the changed COM Port Number is applied, and select **OK**.



12. After the port setting is changed, restart the computer.

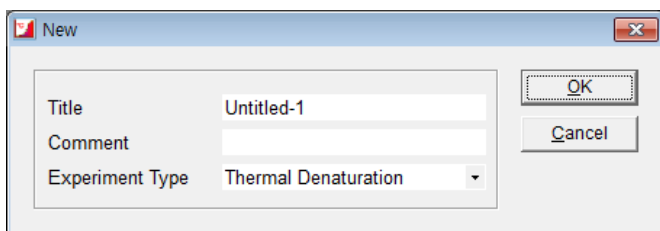
## Measurement

### Thermal Denaturation Mode

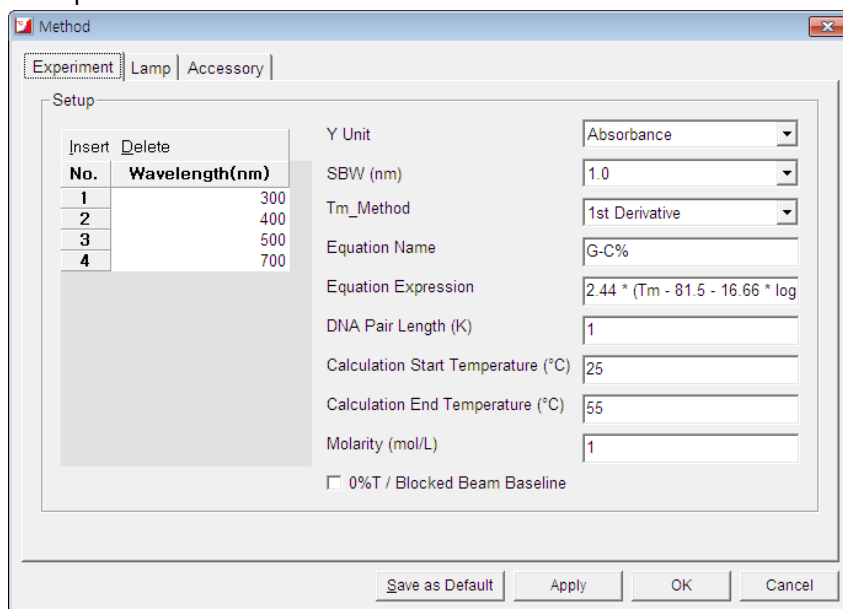
1. Install the Single Cell Peltier Holder referring to the chapter **Installation**.
2. Close the sample compartment cover and turn on the instrument.

**NOTE:** Start the System Self Test after warming up the system for at least 20 minutes.

3. Double-click on the **UV Express** folder and select the **Thermal Denaturation** mode.
4. Select **OK** after finishing the **System Self Test**.
5. Select **New** to open a new window and select **OK**.



6. Open the method in main menu or mode icon on the left side or the main window. Set parameters for Experiment.



- Y unit:** Select one of the display unit: Absorbance, Transmittance, Reflectance or Energy.
- SBW (nm):** Select bandwidth. There are five bandwidths selectable: 0.5, 1, 2, 5 or 20 nm.
- Tm Method:** Select the method for determining melting temperature. Options include: 1st derivative and Average.
- Equation Name:** Enter the name of the formula. %G-C is entered as default, of which equation is formulated in **Equation Expression**.

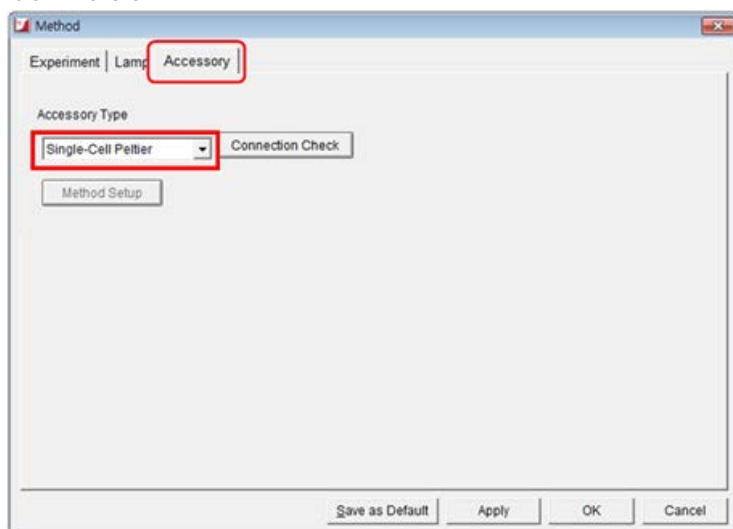
- e. **Equation Expression:** The default equation for the calculation of %G-C base pairs is:

$$\%G-C = 2.44 * (T_m - 81.5 - 16.66 * \log(M) + 500/K)$$

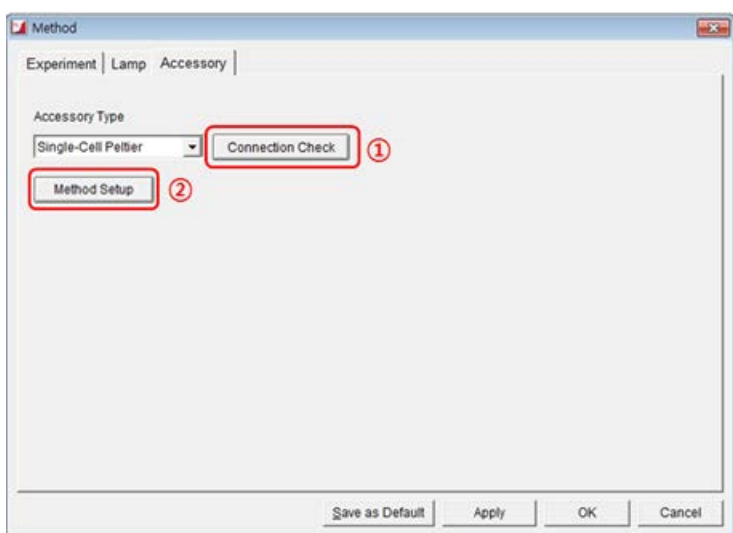
Where M is the molarities of salt in mol/L, K is the DNA base pair length. %G-C will be calculated with estimated  $T_m$  and input values, Molarities (M) and length of DNA (K).

- f. **DNA Pair Length (K):** Enter the DNA base pair length. This value will be used calculating %G-C.  
 g. **Calculation Start Temperature (°C):** Enter the start temperature for calculating the  $T_m$  value.  
 h. **Calculation End Temperature (°C):** Enter the end temperature for calculating the  $T_m$  value.  
 i. **Molarity (mol/L):** Enter the salt molarities of the solution [mol/L]. This value will be used in calculating %G-C.

7. After setting parameters for **Experiment** and **Lamp**, click the **Accessory** tab. And select **Single Cell Peltier**.



8. Select **Connection Check**, then **Method Setup** will be activated. Select **Method Setup**.



**NOTE:** Check the communication between the Computer and the Peltier Controller referring to the chapter *Setting USB to RS-232 Cable (p14)* if the Method Setup is not activated.

9. **Peltier** window will be shown. Set parameters according to the experiment conditions.

The screenshot shows the 'Peltier' window with a 'Single Cell Peltier' tab. It contains two main sections: 'Temperature Control' and 'Temperature Display'.

**Temperature Control:**

- Temperature(\*C): 20
- Monitor: Block (dropdown menu)
- Buttons: Insert, Delete
- Table:
 

No.	Start(*C)	End(*C)	Interval(*C)	Rate(*C/min)	Hold(min)	Error Range(*C)
1	20	100	5	5	0	0.2

**Temperature Display:**

- ☒ Block
- ☒ Probe 1
- ☒ Probe 2
- Probe 1 Offset (\*C): 0
- Probe 2 Offset (\*C): 0
- OK button

#### ► Temperature Control

- Temperature (°C):** Enter the returning temperature after the experiment is finished.
- Monitor:** Select temperature used to monitor during measurement. Options include:Block, Probe1 or Probe2.
- Start (°C):** Enter the start temperature for the measurement.
- End (°C):** Enter the end temperature for the measurement.
- Interval (°C):** Enter the measurement interval temperature. For instance, if you enter 5°C, the sample will be measured from start temperature to end temperature every 5°C.
- Rate (°C/min):** Enter the heating (or cooling) temperature rate in each temperature range.

**NOTE:** *The rate has to be set under or equal to interval value.*

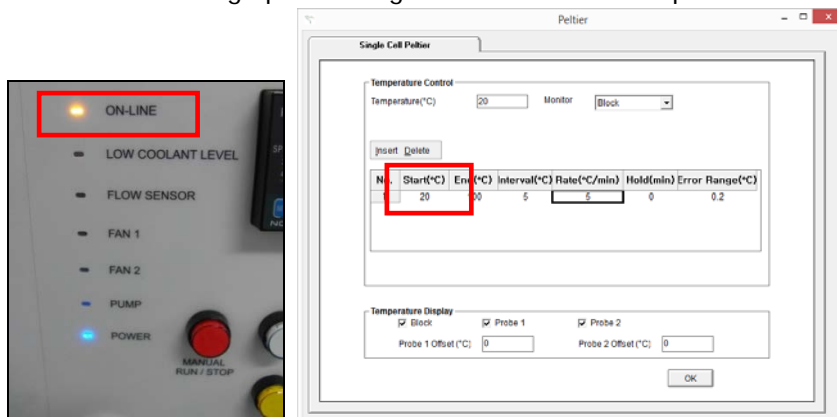
- Hold (min):** Enter the holding time. For example, if you set 1 min, measurement will start one minute passed after temperature reaches the set point.
- Error Range(°C/min):** It shows the temperature tolerance between the sampling and monitored temperature. The measurement will start when the temperature tolerance reaches within the set Error Range.

Example: Set the starting temperature at 20°C and error range with 1°C then, the measurement will start when the temperature reaches between 19°C and 21°C.

#### ► Temperature Display

- Select which temperature will be displayed on the panel:Block, Probe 1 or Probe 2. Note that the selected temperature is only displayed in real time.
- Offset:** This function is used to adjust temperature. **It is only for manufacturing process, so do not modify the values.**

10. After completing the parameter setup, select **Apply** and **OK**. Then the LED for ON-LINE is turned on and it will start heating up or cooling down to the Start temperature in the Single Cell Peltier.



11. Insert blank solutions into the both reference and sample cell holder. Select **Baseline** and then baseline will be measured when it reaches the set **Start Temperature**.

**NOTE:** To monitor the probe temperature, the probes should be immersed in the sample, or to use the block temperature for monitoring, the cell lid should be closed tightly.

<b>Start Temp(°C) :</b>	<b>20</b>	<b>Monitor :</b>	<b>Block</b>
<b>SP Temp(°C) :</b>	<b>20</b>	<b>Error Range(°C) :</b>	<b>0.2</b>
<b>Block Temp(°C) :</b>	<b>19.7</b>	<b>Hold Time :</b>	
<b>Probe1 Temp(°C) :</b>	<b>Open</b>	<b>Elapsed Time :</b>	<b>0 : 4(s)</b>
<b>Probe2 Temp(°C) :</b>	<b>Open</b>	<b>Status :</b>	

- Start Temp (°C):** The starting temperature of experiment.
- SP Temp (°C):** The set temperature to go to the next measurement temp.
- Block Temp (°C):** The temperature of Cell Block.
- Probe 1 Temp (°C):** The temperature of Probe 1.
- Probe 2 Temp (°C):** The temperature of Probe 2.
- Monitor:** Selected temperature is being monitored.
- Error Range (°C):** It shows the temperature tolerance between the sampling and monitored temperature. The measurement will start when the temperature tolerance reaches within the set Error Range.
- Hold Time:** It shows the set holding time.
- Elapsed Time (s):** It shows the elapsed time to reach the sampling temperature.
- Status:** It shows the status of experimental progress.

- Remove the blank solution from the sample cell holder and insert sample solution into the sample cell holder. Select **Sample**, then the measurement will start after the temperature reaches the target temperature.

**NOTE:** To pull out a cell easily, use the cell lifting knob.

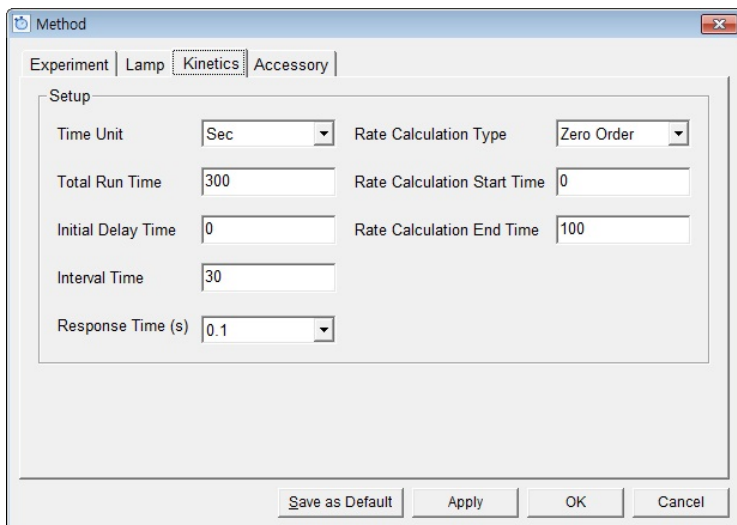


- After the measurement is finished, the results are displayed in the result window. Save or print the results as required.

## Other Measurement Modes

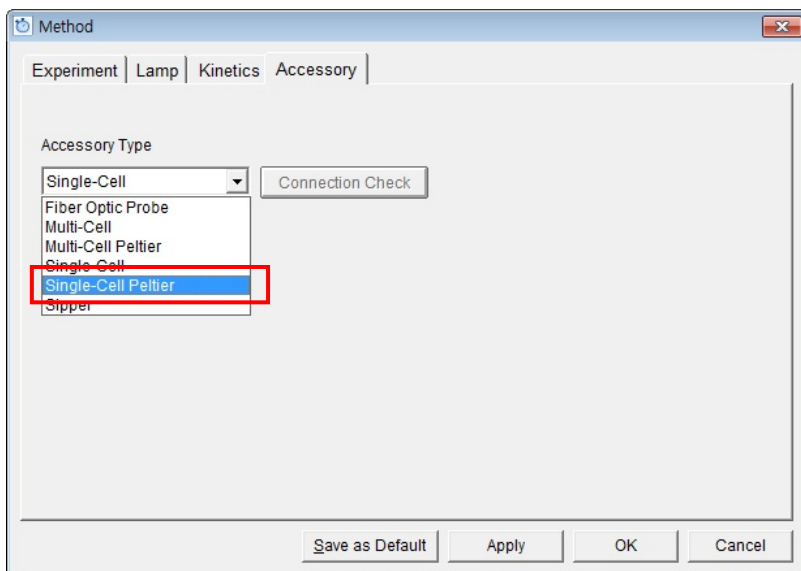
**NOTE:** Peltier Temperature Control Unit is available in all methods, however, unlike Thermal Denaturation, the measurement is only performed with isothermal state.

- Install the Single Cell Peltier Holder referring to chapter **Installation**.
- Close the sample compartment cover and turn on the instrument.
- Double-click on the **UV Express folder** and select one of the modes except Thermal Denaturation. In this case, open kinetics mode as example.
- Select **OK** after finishing the **System Self Test**.
- Select **New** to open a new window and select **OK**.
- Open the method in the main menu or click the mode icon on the left side or the main window. Set parameters for Experiment.

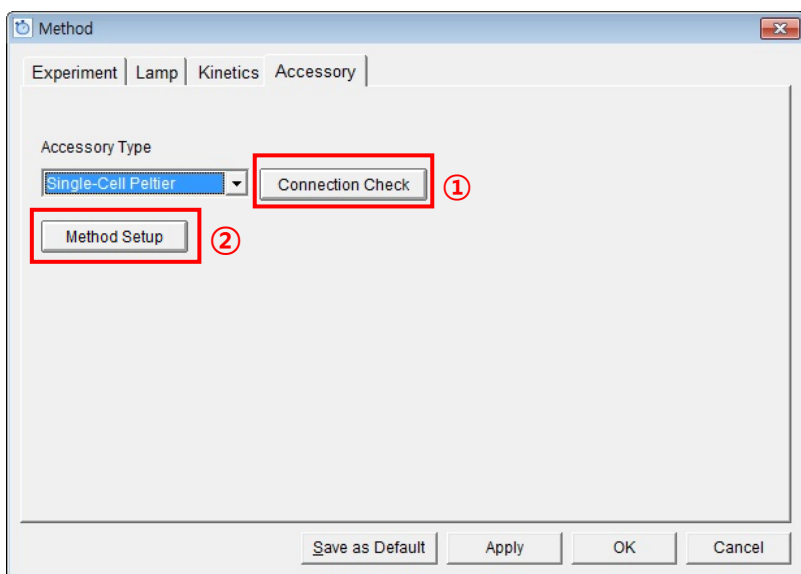


**NOTE:** *If you want to know about the meaning of each parameter of Kinetics and other modes more detail, please refer to X. Measurement Modes of the UV Express Software User Guide.*

7. After setting parameters for Experiment, Lamp and Kinetics, click **Accessory** tab. Select **Single Cell Peltier**.

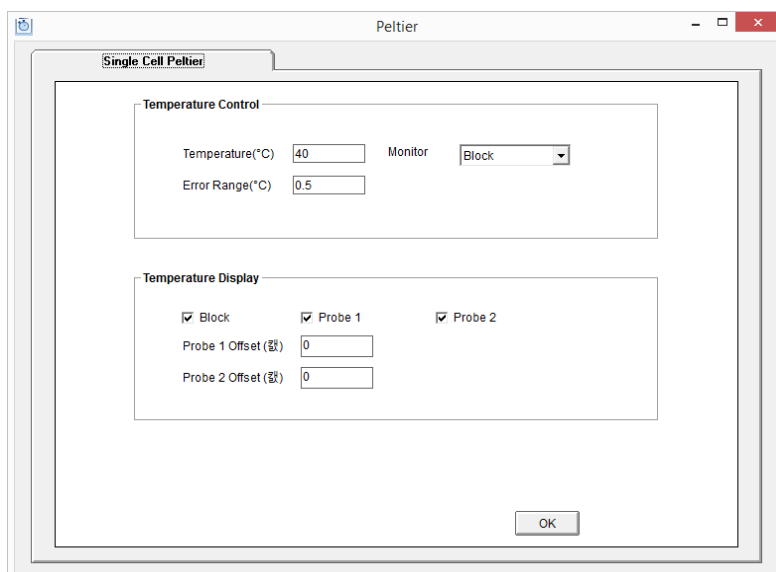


8. Select **Connection check**, the Method Setup will be activated. Select **Method Setup**.



**NOTE:** *Check the communication between Computer and Peltier Controller referring to chapter **Setting USB to RS-232 Cable** (p14) if the Method Setup is not activated.*

9. Peltier window will be shown. Set parameters according to the experiment conditions.



► **Temperature Control**

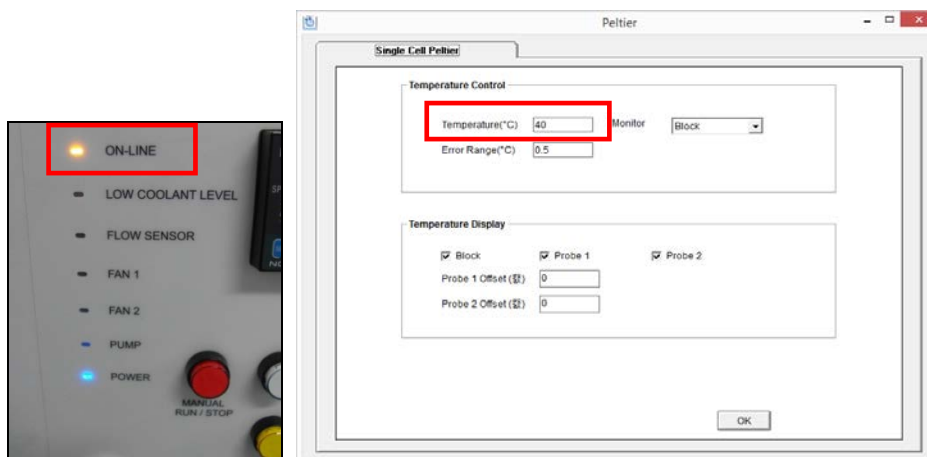
- a. **Temperature (°C):** Enter the returning temperature for the experiment.
- b. **Monitor:** Select temperature used to monitor during measurement. Options include: Block, Probe1 or Probe2.
- c. **Error Range (°C):** It shows the temperature tolerance between the sampling and monitored temperature. The measurement will start when the temperature tolerance reaches within the set Error Range.  
Example: Set the starting temperature at 20°C and error range with 1°C then, the measurement will start when the temperature reaches between 19°C and 21°C.

► **Temperature Display**

- d. Select which temperature will be displayed on the panel: Block, Probe 1 or Probe 2. Note that the selected temperature is only displayed in real time.
- e. **Probe 1, 2 Offset:** This function is used to adjust temperature. **It is only for manufacturing process, so do not modify the values.**

10. After completing the parameter setup, select **Apply** and **OK**. Then the LED for ON-LINE is turned on and it will start heating up or cooling down to the set temperature in the Setup Single Cell Peltier.






11. Insert blank solutions into the both reference and sample cell holder. Select **Baseline (or Zero)** and then baseline will be measured when it reaches the set **Start Temperature**.

**NOTE:** To monitor the probe temperature, the probes should be immersed in the sample, or to use the block temperature for monitoring, the cell lid should be closed tightly.

<b>Start Temp(°C) :</b>	<b>20</b>	<b>Monitor :</b>	<b>Block</b>
<b>SP Temp(°C) :</b>	<b>20</b>	<b>Error Range(°C) :</b>	<b>0.2</b>
<b>Block Temp(°C) :</b>	<b>19.7</b>	<b>Hold Time :</b>	
<b>Probe1 Temp(°C) :</b>	<b>Open</b>	<b>Elapsed Time :</b>	<b>0 : 4(s)</b>
<b>Probe2 Temp(°C) :</b>	<b>Open</b>	<b>Status :</b>	



- Start Temp (°C):** The starting temperature of experiment.
- SP Temp (°C):** The set temperature to go to the next measurement temp.
- Block Temp (°C):** The temperature of Cell Block.
- Probe 1 Temp (°C):** The temperature of Probe 1.
- Probe 2 Temp (°C):** The temperature of Probe 2.
- Monitor:** Selected temperature is being monitored.
- Error Range (°C):** It shows the temperature tolerance between the sampling and monitored temperature. The measurement will start when the temperature tolerance reaches within the set Error Range.
- Hold Time:** It shows the set holding time.
- Elapsed Time (s):** It shows the elapsed time to reach the sampling temperature.
- Status:** It shows the status of experimental progress.

11. Remove blank solution from sample cell holder and insert sample solution into the sample cell holder. Select **Sample**, then the measurement will be started after the temperature reached the target temperature.

**NOTE:** To pull out the cell easily, use the cell lifting knob.



12. After the measurement is finished, the results are displayed in the result window. Save or print results as required.

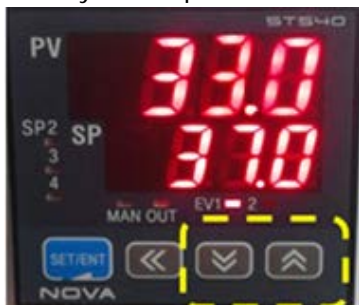
### ***Peltier Controller Auto Tuning Setup***

**NOTE:** Peltier controller can be compatible with various peltier cell holders (Single or Multi). Whenever you exchange the existing peltier cell holder to another one, you should perform the "AUTO TUNING" set up to minimize the temperature fluctuation at the target temperature.

1. Push the Manual button on the control panel of the peltier controller, and then the button light is on.



2. Set any SP temperature between 30~37°C using the  $\nearrow \searrow$  button.



3. Press and hold the SET/ENT button until "G.AT" is shown.



4. Push the SET/ENT button again.



5. Push the  $\Uparrow$  button (OFF  $\rightarrow$  ON).



6. Press the SET/ENT button, and then the MAN LED will blink.



7. The MAN LED will be off after a few minutes.



8. Push the Manual Button (Stop) and then the light is off.



## Troubleshooting

### Power LED is not lit on

1. Check the connection of the power cable or the fuse. The fuse is located at the rear of the instrument.



#### WARNING

*There is risk of receiving a fatal electric shock if the fuses are replaced with the power cord connected.*

*Il y a un risque d'électrocution si les fusibles sont remplacés tandis que le cordon d'alimentation est encore branché.*

2. Turn off and unplug the instrument.
3. Locate the fuse cover on the left rear panel of the instrument.

- Carefully open the compartment latch where the fuse is located.



Location of latch on the  
fuse compartment door

- Disconnect the fuse.
- Replace with a new T5ALfuse (AC 250V). One spare is contained in the power module.
- Close the compartment door.
- Plug in the instrument and turn on.

#### ***On-Line LED is not lit on***

- Check whether the communication cable is connected tightly.
- Check whether the **Air Vent Manual** button is switched off.
- Check whether the **emergency switch** is off.
- When you use the USB to RS-232 cable, change the port setting referring to the chapter **Setting USB to RS-232 Cable** (p14)

#### ***FAN LED is lit on with an alarm sound***

- Fan needs to be replaced.

#### ***Low Water Level' LED blinks with an alarm sound***

- Check the coolant level and if it is lower than L (low) mark, add more coolant.



2. Restart the Peltier Controller.

### ***Flow Sensor LED is lit on with an alarm sound***

1. Check whether the tubing is bent or whether it is connected correctly, and then restart the Peltier Controller.
2. Push the **Air Vent Manual** button on and check if coolant flows properly for about one minute after the error occurs. If the Flow Sensor LED is continuously on with the alarm sounding, contact your PerkinElmer service representative.

### ***Pump LED is lit on with an alarm sound***

1. Check whether the tubing is bent or whether it is connected correctly, and then restart the Peltier Controller.
2. Push the **Air Vent Manual** button to be switched on and check if coolant flows properly for about one minute after the error occurs. If the Pump LED is continuously on with the alarm sounding, contact your PerkinElmer Service representative.

### ***Connection is failed***

1. Check the Interface connector is lined properly.
2. Check whether the **MANUAL RUN/STOP** button is pushed on. If yes, turn off the Manual button.

